

**IN THE UNITED STATES DISTRICT COURT
FOR THE MIDDLE DISTRICT OF NORTH CAROLINA**

COMMON CAUSE, *et al.*,
PLAINTIFFS,
v.
ROBERT A. RUCHO, in his official capacity as
Chairman of the North Carolina Senate
Redistricting Committee for the 2016 Extra
Session and Co-Chairman of the Joint Select
Committee on Congressional Redistricting,
et al.,
DEFENDANTS.

CIVIL ACTION
No. 1:16-CV-1026-WO-JEP

THREE-JUDGE COURT

LEAGUE OF WOMEN VOTERS OF NORTH
CAROLINA, *et al.*,
PLAINTIFFS,
v.
ROBERT A. RUCHO, in his official capacity as
Chairman of the North Carolina Senate
Redistricting Committee for the 2016 Extra
Session and Co-Chairman of the 2016 Joint
Select Committee on Congressional
Redistricting, *et al.*,
DEFENDANTS.

CIVIL ACTION
No. 1:16-CV-1164-WO-JEP

THREE JUDGE PANEL

**BRIEF IN SUPPORT OF LEAGUE OF WOMEN VOTERS OF NORTH
CAROLINA PLAINTIFFS' MOTION IN LIMINE TO EXCLUDE THE
TESTIMONY OF SEAN P. TRENDE**

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INTRODUCTION

Defendants' proffered expert witness Sean P. Trende meets none of the requirements of Federal Rule of Evidence 702. He is unqualified; he seeks to offer opinions that are not based on facts or data; the testimony he would offer is based on unreliable methodology; and many of his proffered analyses are ultimately irrelevant to the disposition of this case. For the reasons that follow, plaintiffs in *League of Women Voters of North Carolina v. Rucho* ("Plaintiffs") respectfully request that this Court exclude the Expert Report of Sean P. Trende, dated April 3, 2017, attached as Ex. 1 ("Trende Rep."), and any testimony offered by Trende at trial.

BACKGROUND

Trende is a first-year graduate student in the political science department of Ohio State University. Trende Rep. at ¶ 9. Trende admits that he is not yet a political scientist. Deposition of Sean P. Trende, dated May 5, 2017, attached as Ex. 2 ("Trende Dep.") 13:19-20. Beyond his studies, Trende is an "elections analyst" for the online content aggregator, RealClearPolitics ("RCP"). Trende Rep. at ¶ 10. Defendants seek to offer Trende's testimony as an expert in "political history, United States voting laws, redistricting, and the study of campaigns and elections." Trende Rep. at ¶ 2. He was retained "to provide expert testimony explaining how the efficiency gap will likely operate in practice." Trende Rep. at ¶ 3.

Plaintiffs seek to exclude all opinions and testimony by Trende because they primarily amount to conjecture based on political anecdotes, rather than conclusions

based on data and reliable quantitative analysis. In the limited cases where Trende seeks to offer political science analysis, he, as an elections analyst, is not qualified by experience, knowledge, or skill to perform that work, and this is evident in his unreliable methods and failure to incorporate error rates into his analyses.

LEGAL STANDARD

The introduction of expert testimony is governed by Fed. R. Evid. 702 and the Supreme Court's decision in *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579 (1993). Under these authorities, expert testimony must be qualified, reliable, and relevant to be admissible. The Court must ensure that the proffered expert opinion is "based on scientific, technical, or other specialized knowledge and not on belief or speculation, and inferences must be derived using scientific or other valid methods." *Oglesby v. Gen. Motors. Corp.*, 190 F.3d 244, 250 (4th Cir. 1999). Similarly, Federal Rule of Evidence 703 "provides that expert opinions based on otherwise inadmissible hearsay are to be admitted only if the facts or data are of a type reasonably relied upon by experts in the particular field in forming opinions or inferences upon the subject." *Daubert*, 509 U.S. at 595 (internal quotation marks omitted). The proponent of the testimony bears the burden of establishing its admissibility by a preponderance of proof. *Cooper v. Smith & Nephew, Inc.*, 259 F.3d 194, 199 (4th Cir. 2001) (citing *Daubert*, 509 U.S. at 592 n.10).

Daubert applies not only to the testimony of scientists but also "to testimony based on 'technical' and 'other specialized' knowledge." *Nease v. Ford Motor Co.*, 848 F.3d 219, 230 (4th Cir. 2017) (quoting *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 141

(1999)). In *Nease*, the Fourth Circuit held that a theory presented by an expert must be more than a mere hypothesis; it must be “‘based upon sufficient facts or data or the product of reliable principles and methods applied reliably to the facts of the case.’” *Id.* at 232 (quoting *Tamraz v. Lincoln Elec. Co.*, 620 F.3d 665, 670 (6th Cir. 2010)). The Fourth Circuit went on to explain that “[g]enerally, scientific methodology involves ‘generating hypotheses and testing them to see if they can be falsified.’” *Id.* (quoting *Daubert*, 509 U.S. at 593).

It is also possible for an expert who is qualified by his or her knowledge or experience to present evidence for which the methodology or theory behind the evidence is not relevant. These cases arise where a witness’s “‘reliability depends heavily on the knowledge and experience of the expert, rather than the methodology or theory behind it.’” *United States v. Thomas*, 490 F. App’x. 514, 520-21 (4th Cir. 2012) (quoting *United States v. Hankey*, 203 F.3d 1160, 1168 (9th Cir. 2000)). Examples of this type of expert knowledge include gang history, *see id.*, the ability to evaluate the worth of professional soccer players on the market, *see Simo v. Mitsubishi Motors N. Am., Inc.*, 245 F. App’x 295, 300 (4th Cir. 2007), and the use of code words in drug transactions, *see United States v. Wilson*, 484 F.3d 267, 273-275 (4th Cir. 2007). This sort of knowledge is based on experience in the field, and is notably distinct from analysis based on facts, data, and scientific methods.

Expert evidence may be excluded if there is “‘simply too great an analytical gap between the data and the opinion proffered.’” *Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 146

(1997). Expert evidence may also be excluded where the analytical methods used are unreliable. In the Fourth Circuit, methods have been found to be unreliable in a variety of circumstances, including where the expert grounds his or her opinion on “speculation and conjecture . . . unsupported by sufficient known facts,” *Ratliff v. State Farm Mut. Auto. Ins. Co.*, 584 F. App’x. 144, 144 (4th Cir. 2014), where an expert’s “analysis failed to distinguish between ‘correlation’ and ‘causation,’” *Verisign, Inc. v. XYZ.COM LLC*, 848 F.3d 292, 300 (4th Cir. 2017), and where an expert develops his or her opinions expressly for the purposes of testifying, *Wehling v. Sandoz Pharm. Corp.*, 1998 WL 546097 at *3-4 (4th Cir. Aug. 20, 1998).

In addition, if an expert purports to be qualified by his or her experience, yet reaches conclusions “without relying on any of the standard indicia associated with this particular [analysis],” the Fourth Circuit has excluded the expert’s opinion because the evidence must be “connected to existing data by something more than the ‘it is so because I say it is so’ of the expert.” *Holesapple v. Barrett*, 5 F. App’x 177, 179-180 (4th Cir. 2001). In that case, the Fourth Circuit found the expert’s testimony to be “an almost perfect example of an *ipse dixit* opinion,” *id.* at 180, because it was not based on any standard, reliable analysis of the facts of the particular incident. All evidence offered by an expert, whether scientific or based on the expert’s knowledge and experience, must be relevant. If an expert merely “summarizes the evidence of record, without providing any specialized analysis to support [the expert’s] conclusions,” that evidence will not be relevant and may be excluded. *Kennedy v. Joy Techs. Inc.*, 269 F. App’x 302, 312 (4th

Cir. 2008).

ARGUMENT

The Court should exclude all opinions and testimony from Trende. *First*, he is not qualified by his “knowledge, skill, experience, training or education” to offer opinions on the measurement of partisan gerrymandering. And *second*, the bulk of Trende’s testimony is not “based on sufficient facts or data,” and the little analysis he does provide is not “the product of reliable principles and methods.” Fed. R. Evid. 702.

I. Trende Is Not Qualified by His Education, Training, Knowledge, Skill, or Experience.

A. Trende Is Not Qualified by His Education or Training.

One way that a person may qualify as an expert is through his or her education and training. For example, a person may hold a Ph.D. in the field in which he or she seeks to offer expert opinions. Trende cannot qualify as an expert through his education and training.

The educational credentials that Trende possesses are an undergraduate degree from Yale University in 1995, with a double major in history and political science, a J.D. from Duke University in 2001, and a master’s degree in political science, also from Duke University in 2001. Trende took two semesters of graduate-level statistics sixteen years ago, but neither of those courses were credited towards his current graduate study at Ohio State University. Trende Dep. 18:20-22. Trende has only completed one year of his doctoral program in political science, and will have to pass “comps” at the end of his second year to become a doctoral candidate and progress beyond his current designation

as a student. Trende Dep. 15:10-23. If he does not pass “comps” then he will not be able to complete a doctoral dissertation. Trende lists no other education or training in his curriculum vitae, attached as Ex. 3, or in his expert report.

In short, Trende has completed one year of graduate level coursework in political science. This is simply insufficient to qualify him, based on education, as an expert seeking to opine about the statistical analysis of elections, redistricting, and partisan gerrymandering. At a minimum, an expert providing opinion testimony on the efficiency gap as a measure of partisan gerrymandering should have earned a Ph.D. in a relevant field.

B. Trende Is Not Qualified by His Experience.

Trende admits that he is not yet a political scientist, Trende Dep. 13:19-20, but seeks to qualify as an expert based on his position as an elections analyst with RCP. Trende Rep. at ¶ 10. Trende describes RCP as “a one-stop shop for political analysis from all sides of the political spectrum [that] is recognized as a pioneer in the field of poll aggregation.” Trende Rep. at ¶ 11. Trende’s role at RCP is to track, analyze, and write about elections. He is in charge of rating the competitiveness of U.S. House of Representatives races, but only “collaborates” in rating the competitiveness of presidential, senatorial, and gubernatorial races. Trende Rep. at ¶ 12. Trende does not engage in any quantitative analysis or aggregation of polling data himself, but rather relies on John McIntyre and Kavon Nikrad to do that work for presidential, senatorial, and gubernatorial races. Trende Dep. 25:14-19. Quantitative analysis and polling

aggregation are “almost never used” for House races; instead, Trende uses a “holistic approach” to determine qualitatively which House races will be competitive in upcoming elections. This holistic approach includes reviewing factors like the Cook Partisan Voting Index, candidate quality, and candidate and challenger fundraising, to evaluate whether a House race will be competitive. Trende Dep. 27:14-28:10.

Although Trende does not keep a tally of how accurate his predictions prove to be, Trende Dep. 33:24-34:5, he could plausibly claim to be qualified as an expert were he offering testimony to this Court about the competitiveness of House races. In this case, though, he seeks to offer opinions on everything but that topic. Indeed, he seeks to offer opinions here that require sophisticated political science methods such as Bayesian inference, regression analyses, and conditional probability analyses. Yet Trende has no experience with any of these techniques, and indeed has not even taken classes yet on Bayesian inference or causation modeling. Trende Dep. 19:5-6, 130:12-16. The best Trende can offer with respect to Bayesian inference is that “in terms of going in and explaining the exact methodology of how Bayesian hierarchical modeling works . . . I can’t do that, but I know the gist of what [Dr. Jackman is] doing.” Trende Dep. 96:3-7. “Know[ing] the gist” of a topic is a far cry from the extensive experience the federal courts require of an expert.

Trende also seeks to offer opinions here on redistricting, yet his experience with this subject is limited to having drawn historical congressional district maps using Adobe Illustrator (which he notes is not Geographical Information Systems software), Trende

Dep. 65:2-14, and having co-edited the 2014 Almanac of American Politics (which includes descriptions of House districts in use in the current cycle), Trende Dep. 165:14-16. Interestingly, one of these descriptions contains a harsh criticism of North Carolina's 2011 congressional plan for aggressively seeking partisan advantage for Republicans.¹ Trende has never published an academic article on redistricting (or on anything else for that matter). Trende Dep. 13:21-14:3. Nor has he ever designed a legally compliant district plan or provided advice to a party responsible for redistricting. Indeed, this summer he plans to take his first class on redistricting. Trende Dep. 16:15-18.

Trende thus has real-world experience evaluating qualitatively which House races are likely to be competitive in upcoming elections. This experience is insufficient to qualify him as an expert seeking to opine about statistical analysis and about redistricting.

C. Trende Is Not Qualified by His Knowledge or Skill.

Trende sums up the opinions he seeks to offer as relating to “how the efficiency gap will likely operate in practice.” Trende Rep. at ¶ 3. To assess the measure's operation, his knowledge and skill should, at the very least, include an understanding of the concept of partisan symmetry in political science as well as the properties of the

¹ The relevant passage reads: “In July 2011, Republicans quickly released and passed a new plan that unraveled and reversed the Democrats’ 2002 map, and then some. They painstakingly packed Democratic voters into just three of the state’s 13 seats. . . . Their handiwork endangered five of the state’s seven Democrats.” Almanac of American Politics 2014, at 1233 (Michael Barone et al. eds., 2014), attached as Ex. 14. Trende agreed at his deposition that although he did not write this chapter of the Almanac, “it sounds like an accurate description.” Trende Dep. 167:20-22.

efficiency gap. As outlined below, however, Trende displayed a clear lack of familiarity with both of these topics during his deposition.

1. Trende Lacks Knowledge About Partisan Symmetry Metrics.

Partisan symmetry is a crucial concept in the study of redistricting. Where partisan symmetry exists, a redistricting plan treats the major parties equally in terms of the conversion of their statewide votes into legislative seats. Conversely, a plan is asymmetric if it allows one party to translate its popular support into legislative representation more effectively than its rival. There are a number of ways to measure partisan asymmetry,² but the two most common metrics are partisan bias and the efficiency gap. *See* Expert Report of Simon Jackman, dated April 18, 2017, attached as Ex. 4 (“Jackman Rep.”), at 9-18.

Partisan bias, first, is the difference between the shares of *seats* that the major parties would win if they each received the same share (typically 50%) of the statewide *vote*. *See LULAC v. Perry*, 548 U.S. 399, 420 (2006) (opinion of Kennedy, J.) (defining the metric as “the extent to which a majority party would fare better than the minority party, should their respective shares of the vote reverse”); Bernard Grofman & Gary King, *The Future of Partisan Symmetry as a Judicial Test for Partisan Gerrymandering*

² Other metrics include the mean-median difference, *see* Michael D. McDonald & Robin E. Best, *Unfair Partisan Gerrymanders in Politics and Law: A Diagnostic Applied to Six Cases*, 14 Election L.J. 312 (2015), and the difference between the parties’ average margins of victory, *see* Samuel S. H. Wang, *Three Tests for Practical Evaluation of Partisan Gerrymandering*, 68 Stan. L. Rev. 1263 (2016), attached as Exs. 15 and 16.

After LULAC v. Perry, 6 Election L.J. 2, 6-13 (2007), attached as Ex. 5. Partisan bias has been used for decades as a measure of partisan asymmetry.

Next, the efficiency gap is rooted in the insight that partisan gerrymandering is always carried out in one of two ways: the *cracking* of a party's supporters among many districts, in which their preferred candidates lose by relatively narrow margins; or the *packing* of a party's backers in a few districts, in which their preferred candidates win by overwhelming margins. Both cracking and packing produce what are known as *wasted votes* because they do not contribute to a candidate's election. In the case of cracking, all votes cast for the losing candidate are wasted; in the case of packing, all votes cast for the winning candidate, above the 50% (plus one) threshold needed for victory, are wasted. The efficiency gap is simply one party's total wasted votes in an election, minus the other party's total wasted votes, divided by the total number of votes cast. It captures in a single figure the extent to which one party's voters are more cracked and packed than the other party's voters. *See Whitford v. Gill*, 218 F. Supp. 3d 837, 854 (W.D. Wis. 2016); Jackman Rep. at 17-18.

The efficiency gap can be calculated either as described above (the "full" method) or through a "simplified" method that assumes equal district turnout. The full method is "preferable because it accounts for the reality that voters do not go to the polls at equal rates across districts," *Whitford*, 218 F. Supp. 3d at 907, and it is the only one that Dr. Jackman and Dr. Jowei Chen used in this case. Nevertheless, the correlation between the

full and the simplified methods is extremely high. *See* Rebuttal Report of Simon Jackman, dated April 17, 2017, attached as Ex. 6 (“Jackman Rebuttal Rep.”), at 17.

During his deposition, Trende took part in the following exchange:

Q: Now there are a number of different measures of partisan symmetry that scholars have proposed in political science, right?

A: Yes

Q: Can you name all of the symmetry metrics you’re aware of?

A: There’s no way I can do that.

Q: Can you name anything other than the efficiency gap and partisan bias?

A: No.

Trende Dep. 66:9-18.

This exchange betrays a serious lack of knowledge on Trende’s part. First he was unable to name even a single measure of partisan symmetry. Then, after being prompted with the two most widely used metrics, he could not identify any beyond them. He was apparently unaware of the vigorous political science debate about how best to measure partisan gerrymandering.

Even more alarming, when asked to provide the *definition* of partisan bias, Trende replied that “my understanding of the partisan bias is it is the . . . deviation of the number of seats from the number of votes. I think it’s the proportional representation measure.”

Trende Dep. 58:8-15. This answer is egregiously wrong, and no one familiar with the

literature in this area could have made such a mistake. The reason why partisan bias was devised in the first place is that single-member-district electoral systems rarely produce proportional representation. Partisan bias thus does not measure the deviation from proportionality, but rather asks how different the parties' seat shares would be if they each received the same vote share. Any degree of disproportionality is acceptable, as long as if the parties' positions were reversed, the other party would enjoy an equally disproportionate advantage. *See* Grofman & King, *supra*, at 8 (“[P]artisan bias does *not* require ‘proportional representation.’”).

Not only is partisan bias a foundational concept in the study of redistricting, but its definition was *repeated* in Dr. Jackman's report, and one of the articles that introduced the measure was listed in the report's references. Jackman Rep. at 13, 67; Andrew Gelman & Gary King, *Estimating the Consequences of Electoral Redistricting*, 85 J. Am. Stat. Ass'n 274 (1990). Dr. Jackman also calculated partisan bias for every observation in his database (including North Carolina in 2016), and analyzed its relationship with the efficiency gap in competitive and uncompetitive electoral settings. Jackman Rep. at 60-62; Jackman Rebuttal Rep. at 2-7. Given his answers during the deposition, it appears that Trende did not understand this section of Dr. Jackman's report and does not actually grasp what partisan bias is or how to calculate it.

Turning to the efficiency gap, if it is to be calculated using the simplified method (even though the full method is preferable), a specific formula must be used: a party's seat share minus 50%, minus two times a party's vote share minus 50%. In mathematical

notation, this is $(S - 50\%) - 2 \times (V - 50\%)$, where S is a party's seat share and V is that party's vote share. Yet again, Trende was unable to identify this formula at his deposition, even though he purported to calculate the efficiency gap using the simplified method in his report. He said: "I believe the equation is the share of the votes time two and subtract the share of the seats. I can't remember where the coefficient goes off the top of my head." Trende Dep. 69:4-7. He thus thought (though he was not sure) that the formula was $2V - S$, which is incorrect and would yield gibberish if it were applied.³

Trende also replied, "I don't know," when asked, "If we use the simplified method for calculating the efficiency gap, is it possible to read the efficiency gap [from] the seat/vote curve?" Trende Dep. 70:22-80:1. The right answer is that it is indeed possible. The seat/vote curve has a slope of two when the efficiency gap (using the simplified method) is equal to zero. See *Whitford*, 218 F. Supp. 3d at 907. Thus all an analyst must do is measure the vertical distance between a point (representing the election outcome) and the seat/vote curve with that slope. Once more, Trende's inability to recall basic facts about the efficiency gap calls into question his opinions about the metric.

Trende made further errors when he tried to calculate the efficiency gap and carry out sensitivity testing. As to the efficiency gap, he produced two files containing his estimates: "effgaps.csv" and "egjack.csv." These files contained many conflicting values for the exact same observations, and Trende was unable to explain any of the

³ Confirming this was no slip of the tongue, Trende again incorrectly stated the formula for the simplified form of the efficiency gap later in his deposition. "When I calculate the simplified version of the efficiency gap, I look at vote shares over 50 percent, multiply it by two, [and] subtract the seat share over 50 percent." Trende Dep. 104:6-9.

discrepancies. He was “sure one of them is wrong,” but did not know which one, and speculated that a “bad sort is usually the culprit.” Trende Dep. 124:22, 126:7.

As to Trende’s sensitivity testing, similarly, an early version of his results, saved in a file called “MM.csv,” was so filled with mistakes that he warned against relying on the file. Trende Dep. 209:9-20. He was eventually able to get his sensitivity testing to work better only by following Dr. Jackman’s R code and checking his outputs against Dr. Jackman’s. As he said, “I specifically remember being relieved when North Carolina in 2016 matched up with what Dr. Jackman had because I think that’s how I caught that I had made a mistake.” Trende Dep. 210:7-11.

To be sure, Trende may be able to use a program like R to calculate the efficiency gap when he has the right formula in front of him, and can verify his results with Dr. Jackman’s. But as defendants’ expert Dr. James Gimpel points out, there is a difference between a well-trained professional and a technician. People who are “technically proficient at using the software” may still “lack the background knowledge, the experience, the judgment . . . to think through the implications.” Deposition of James G. Gimpel, dated April 27, 2017, 44:21-45:8, attached as Ex. 7. Dr. Gimpel was not discussing Trende in this quote, of course, but Trende nevertheless fits Dr. Gimpel’s definition of a technician. He has learned how to calculate certain metrics when given the underlying data and formulas to use. But he has *not* demonstrated “the background knowledge, the experience, and the judgment” to think through the implications of those calculations. And it is the latter that is necessary for qualification as an expert.

2. Trende Has Problems Understanding and Running R Code.

Proceeding from substantive knowledge to methodological ability, plaintiffs' experts used a coding language called "R" to conduct most of their analyses. R is the software package of choice for political scientists examining large volumes of data. Both Dr. Jackman and Dr. Chen saved all of their R code showing all of the calculations they used to produce the opinions in their expert reports. This code was provided to Trende by defendants' counsel.

However, Trende laments that he "had trouble getting Dr. Jackman's code to run." Trende Dep. 10:4. He claims that one reason he "can't give a strong opinion" about a particular piece of Jackman's analysis is that "I could never get his regression to run." Trende admits that he is not suggesting the R code is faulty, adding that he "assum[es] it runs just fine on Dr. Jackman's computer." Trende Dep. 222:12-17.

Trende also asserts that "Dr. Chen's code does not run well on the latest version of Java, and seems to produce compiler errors until an earlier version is found and the proper packages are added to the class path." Trende Rep. at ¶ 39. Trende further complains that he had "tried to get Dr. Chen and [Dr. Jonathan] Rodden's code to work . . . both in terms of R and Adobe and [he] ha[d]n't been terribly successful in doing it." Trende Dep 65:23-66:1.

Professors Jackman, Chen, and Rodden have had dozens of articles accepted and published by peer-reviewed political science journals. Dr. Simon Jackman, Curriculum Vitae, attached as Ex. 8; Dr. Jowei Chen, Curriculum Vitae, attached as Ex. 9; Dr.

Jonathan Rodden, Curriculum Vitae, attached as Ex. 10. Part of the submission process for these articles involves making one's code and data available to the peer-reviewers so they can replicate and test the conclusions reached by the author. One of the highest rated political science journals, the American Political Science Review, includes the following guideline for submissions: "Authors of accepted papers with quantitative, experimental, and simulation results will be required to submit data sets, software and code, and all information needed for reproducing their findings" American Political Science Association, APSR Submission Guidelines, Updated August 26, 2016, attached as Ex. 11.

That Dr. Jackman, Dr. Chen, and Dr. Rodden regularly produce R code that is reviewed and tested by their fellow political scientists suggests that it is not they who have problems with their code—but rather that Trende has difficulties understanding and applying their work. Trende himself "certainly agree[s]" that Dr. Jackman "can write R packages better than [he can]." Trende Dep. 237:2-4. Trende's inability to run, let alone analyze, political scientists' R code highlights his lack of sufficient skill to qualify as an expert in this case.

II. Trende's Opinions Are Unreliable Because They Are Based on Anecdotes Rather than Analysis, Do Not Rely on Facts or Data at All, or Have Methodological Deficiencies.

Even if the Court believes that Trende is qualified to serve as an expert here, all of the opinions he seeks to offer are nevertheless inadmissible because they are not reliable. The most common problem appearing throughout Trende's report is that he provides

anecdotes to support his opinions rather than rigorous statistical analysis. A second systemic flaw is that Trende reaches conclusions that have no facts, data, or analysis to support them. And third, where Trende does actually attempt some analysis, he either fails to incorporate error rates or omits important data, meaning that his conclusions cannot be relied upon. Trende's opinions should therefore be excluded under Fed. R. Evid. 702 because they are not reliable.

A. Trende Offers Anecdotes in the Place of Analysis.

In order to grasp just how methodologically deficient Trende's reliance on anecdotes is, it is helpful to compare his analytical approach to Dr. Jackman's. Both Trende and Dr. Jackman were interested in (1) whether a party's control of the redistricting process leads to an efficiency gap favoring that party; and (2) whether a plan's large initial efficiency gap persists over the plan's lifetime. Dr. Jackman tackled the first issue by determining which institution designed each plan in his database, and then running a series of regressions that probed the relationships between the line-drawing institution and the efficiency gap. Jackman Rep. at 31-37. Dr. Jackman addressed the second issue by comparing the efficiency gap's within-plan variance to its between-plan variance, Jackman Rep. at 31; by running a panel of prognostic tests examining how well a plan's initial efficiency gap predicts its remainder-of-plan average efficiency gap, Jackman Rep. at 41-47; by determining the regression relationship between a plan's initial efficiency gap and its remainder-of-plan average efficiency gap, Jackman Rep. at 47-51; and by conducting sensitivity testing for all congressional plans

currently in effect, Jackman Rep. at 54-57. Through these rigorous analyses, Dr. Jackman concluded that party control is a significant driver of the efficiency gap and that large initial efficiency gaps are durable.

Importantly, Trende does not challenge *any* of the methods that Dr. Jackman used to reach his conclusions. Trende does not “identify any errors with Professor Jackman’s methodology” in examining the impact of party control on the efficiency gap. Trende Dep. 213:13-15. He does not “suggest[] any changes” to Dr. Jackman’s panel of prognostic tests. Trende Dep. 146:13-17. He does not “identify any problems with the method that Professor Jackman used” to analyze the relationship between a plan’s initial efficiency gap and its remainder-of-plan average efficiency gap. Trende Dep. 231:22-24. And he does not “identify anything in Dr. Jackman’s methodology that [he] would change with respect to imputations” for uncontested races. Trende Dep. 114:1-4.

If Trende does not dispute any of Dr. Jackman’s analytical techniques, why does he reach different conclusions about the impact of party control on the efficiency gap and the durability of a plan’s large initial efficiency gap? The answer is that rather than analyze all of the cases in Dr. Jackman’s database, Trende plucks a series of unrepresentative anecdotes and then argues that they point in the opposite direction. As Dr. Jackman notes of Trende’s stories, “All of these anecdotes have exactly the same structure. Either a plan exhibits large efficiency gaps when we might have expected it to exhibit small ones (because it was designed by a court, a commission, or divided government). Or a plan exhibits small efficiency gaps (or even efficiency gaps favoring

the opposing party) when we might have expected it to exhibit large ones (because it was designed by a single party). Or a plan's efficiency gap fluctuates significantly from election to election." Jackman Rebuttal Rep. at 21.

The fundamental problem with these examples—which take up close to half of Trende's report, Trende Rep. at ¶¶ 76-140—is that they are “unrepresentative anecdotes, not a comprehensive analysis of the data.” Jackman Rebuttal Rep. at 21. Trende admitted as much at his deposition. He stated that his anecdotes cover only one-sixth of the observations in Dr. Jackman's database. Trende Dep. 148:1-18. He also agreed that if he had examined a different subset of the entries, it would “be possible that [he] would reach different conclusions.” Trende Dep. 148:19-22.

Elsewhere in his deposition, Trende explained how the impact of party control on the efficiency gap *should* be studied. He would “create a regression model” and “then let it rip in R.” Trende Dep. 130:1-4. If there were cases that did not fit the model perfectly—unrepresentative anecdotes—he would not dismiss the model's results, but rather “would say there are false positives, but generally the expected outcome at 95 percent confidence is . . . positive.” Trende Dep. 132:5-8. Defendants' other expert, Dr. Gimpel, confirmed that “some kind of regression analysis” would be the right technique “[i]f you're trying to figure out . . . how control over the redistricting process . . . affects the efficiency gaps exhibited by a redistricting plan.” Gimpel Dep. 265:23-267:17. Asked why he did not conduct such an analysis, Trende could only reply that “one of the better things about being on the defense side is you don't bear a burden.” Trende Dep. 215:11-

13. But in fact, *both* sides' experts, not just plaintiffs', are required to provide reliable opinions.

Another glaring example of Trende's preference for anecdotes over analysis arises in section nine of his report. Trende is interested in this section in exploring the relationship between the efficiency gap and electoral competitiveness. This could be done systematically over all of the cases in Dr. Jackman's dataset—in which case the analysis would show that there is *no* relationship, and thus that the efficiency gap does not conflate partisan symmetry with competitiveness. But as is characteristic of all his work in this case, Trende considers not hundreds of observations but rather three: two hypothetical plans and the real-world case of Washington State in the 1990s. Trende Rep. at ¶¶ 167-77. From this miniscule number of cases, Trende would like the Court to extrapolate a finding that the efficiency gap “encourage[s] uncompetitive districts and entrenched majorities.” But this is simply not how reliable expert analysis works. Sweeping conclusions require rigorous and comprehensive study, not the brandishing of a few cherry-picked examples.

B. Trende Offers Conclusions Without Facts or Data to Support Them.

A second systemic problem with Trende's report is that he offers a variety of opinions that are not based on facts, data, or analysis at all. In these cases, his approach is “it is so because I say so,” and his ipse dixit opinions should be excluded. *Holesapple*, 5 F. App'x at 179-80.

A good illustration of this kind of unsupported opinion is Trende’s claim in part one of his report that the differences between Dr. Jackman’s methodological choices and those of other scholars “are not immaterial.” Trende Rep. at ¶ 32. Trende asserts that it makes a difference whether states with at least seven or at least eight seats are analyzed, whether the efficiency gap is reported in percentage points or in seats, and whether the full form or the simplified form of the efficiency gap is used. But he offers no facts or data to support this contention—to show that these minor technical variations are substantively meaningful. Instead, the Court is asked to rely on his say-so.

In fact, these variations are largely irrelevant. Trende admitted at his deposition that North Carolina has thirteen congressional districts, meaning it “is covered by both Dr. Jackman and [other scholars’] analyses.” Trende Dep. 73:21-24. Trende also conceded that thanks to its enormous pro-Republican efficiency gap, “in 2016 the North Carolina congressional plan exceeded both Dr. Jackman and [other scholars’] thresholds.” Trende Dep. 72:21-25. And as noted earlier, the correlation between the full form and the simplified form of the efficiency gap is extremely high: about 0.98. Jackman Rebuttal Rep. at 17. As Dr. Jackman testified in *Whitford*, “as a practical matter . . . there’s very little difference and certainly no meaningful practical difference between the two methods.” Trial Transcript 185:21-25, *Whitford v. Nichol*, 218 F. Supp. 3d 837, 854 (W.D. Wis. 2016) (No. 1:15-cv-421-bbc), attached as Ex. 12. At his deposition, Trende essentially conceded the point, stating that “we have a peer-reviewed article, a

law review article . . . and an expert report who said they're the same thing, so ultimately I'm not sure that they can be considered different." Trende Dep. 64:5-9.

Another example of Trende's unsubstantiated opinions is his assertion in part three of his report that "the efficiency gap is proportional representation." Trende Rep. at ¶ 41. To back this claim, one would need to calculate the deviation from proportionality for each observation in Dr. Jackman's database, and then to compare this figure to the efficiency gap for each observation. This analysis would show that the efficiency gap is simply not the same as disproportionality. The efficiency gap "neither requires nor encourages proportional representation," and "[i]n fact, proportional representation is *incompatible* with a consistently low efficiency gap." Jackman Rebuttal Rep. at 19.

Trende, however, conducted no such analysis. Instead, he simply listed the formulas for the simplified form of the efficiency gap and for the deviation from proportional representation. He also displayed the seat-vote curves associated with a zero score on each metric. Trende Rep. at ¶¶ 41-46. These basic textbook materials are not facts or data that could corroborate Trende's conclusion about the equivalence of the efficiency gap and disproportionality. Indeed, they are nothing more than the metrics' definitions and visualizations.

Still another case of Trende making bald assertions without evidentiary support is his statement that he is "unconvinced that the correlation Dr. Jackman finds [between party control of the redistricting process and the efficiency gap] has causal power." Trende Rep. at ¶ 178. Trende is referring here to the sophisticated fixed effects models

that Dr. Jackman used to study how different redistricting institutions influence the efficiency gap. Per the professional norm, Dr. Jackman included his regression results, error rates and confidence intervals, and t-statistics. Jackman Rep. at 33. Based on these calculations, Dr. Jackman concluded that “changes in the distribution of efficiency gap scores in recent decades can be confidently attributed to changes in partisan control of redistricting, and, in particular, to the increased prevalence of Republican control of Congressional redistricting.” Jackman Rep. at 37.

As discussed above, Trende does not challenge any of Dr. Jackman’s methods—either here or elsewhere in his report. He does not even seem to understand them, stating at his deposition that “I wished I could have picked up a phone to ask him exactly what he was doing. I’m not sure I could summarize it here.” Trende Dep. 219:3-8. To explain why he is nevertheless “unconvinced” by Dr. Jackman’s findings, Trende points only to the pro-Republican shift of the efficiency gap in the 1990s. Trende Rep. at ¶¶ 181. But this is both a fact previously noted in Dr. Jackman’s report, Jackman Rep. at 29, and a non sequitur. “[T]hat there are divergences between the efficiency gap’s trends over time and the temporal patterns of party control over redistricting” is “unsurprising since no one has asserted that party control is the *only* explanation for the efficiency gap, such that the efficiency gap follows party control in lockstep.” Jackman Rebuttal Rep. at 26.

C. Where He Engages in Analysis, Trende’s Work Is Full of Methodological Flaws.

Lastly, on the few occasions where Trende actually offers some data and attempts some analysis, his lack of experience and expertise is evident. In part seven of his report,

he attempts to replicate one small portion of the analysis conducted by Dr. Jackman in the *Whitford* litigation (but not in this case). As part of his investigation of the efficiency gap's properties, Dr. Jackman listed a number of state house plans that were “utterly unambiguous with respect to the sign of the efficiency gap estimates recorded over the life of the plan.” Expert Report of Simon Jackman at 53, dated July 7, 2015, *Whitford v. Nichol*, 218 F. Supp. 3d 837, 854 (W.D. Wis. 2016) (No. 1:15-cv-421-bbc), attached as Ex. 13 (“Jackman *Whitford* Rep.”). Dr. Jackman could not have been clearer that in compiling this list, he took into account the uncertainty (or potential error) associated with each efficiency gap estimate. Indeed, immediately after presenting the list, he noted that many more plans exhibit efficiency gaps of the same sign if the “utterly unambiguous” requirement is relaxed. Jackman *Whitford* Rep. at 55.

Trende, however, made no effort to consider the uncertainty of each efficiency gap estimate when he tried to replicate Dr. Jackman's analysis at the congressional level. Asked “Did you account for uncertainty when you calculated your efficiency gaps?” he replied “No, I didn't calculate error bars.” Trende Dep. 127:7-9. Instead, he exclusively (and crudely) used point estimates for the efficiency gap, thus completely ignoring the uncertainty that exists for each value. This is a fatal flaw both because expert analysis “should consider the known or potential rate of error,” *Daubert*, 509 U.S. at 594, and because it means he did not successfully replicate Dr. Jackman's work.

A further example of Trende's flawed methodology comes in part eight of his report, where he again attempts to replicate one of Dr. Jackman's analyses. To ensure that

the enormous pro-Republican efficiency gap exhibited by North Carolina's congressional plan in 2016 is a *durable* feature of the plan (rather than a one-off fluke), Dr. Jackman subjected the plan to sensitivity testing. That is, he took North Carolina's 2016 election results and then shifted the statewide vote by up to ten percentage points in each party's direction. For each percentage point shift, Dr. Jackman recalculated the efficiency gap and displayed it in a chart. Crucially, Dr. Jackman included tick marks in the chart showing how often swings of that magnitude have occurred in North Carolina since 1972. These tick marks allow viewers to determine which potential efficiency gap scores are more or less likely based on historical trends. Jackman Rep. at 57-59.

Trende tries to carry out analogous sensitivity testing for congressional plans in effect in this cycle. Trende Rep. at ¶¶ 147-66. But there are serious problems with his effort. First, he uses *national* (rather than *state*) election data to decide by how many points to shift each state's vote share in each direction. Trende Dep. 192:21-25. This is wrong because states do not always move in tandem with the national electoral environment. Jackman Rebuttal Rep. at 24. Second, Trende makes no effort to consider the *likelihood* of different electoral outcomes. He includes no tick marks showing how often swings of a given size have previously occurred. He thus treats epic waves like those of 1974 and 1994 as being as plausible as any other result. But this too is wrong; waves that large occur only very rarely, and most elections are much closer to the historical mean. Jackman Rebuttal Rep. at 24. In combination, these defects render his

sensitivity testing unreliable. The Court simply cannot be confident that it captures *realistic* scenarios for the states it covers.

CONCLUSION

In sum, Trende shares some interesting political anecdotes and could have offered an expert opinion on the competitiveness of congressional elections in North Carolina and elsewhere. But he is not qualified by his education, training, knowledge, skill, or experience to offer opinions with respect to statistical analysis, redistricting, or partisan gerrymandering. This lack of qualification is apparent in his proclivity for anecdotes rather than analysis, in his declaration of conclusions unsupported by facts or data, and in the methodological deficiency of the analyses he does attempt. For the foregoing reasons, Trende's report should be stricken in its entirety, and Trende's testimony excluded at trial.

Respectfully submitted, this 19th day of June, 2017.

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CERTIFICATE OF SERVICE

I hereby certify that I have this day served a copy of the foregoing via electronic mail, addressed to counsel for all parties in this consolidated action.

This the 19th day of June, 2017.

/s/ Ruth M. Greenwood _____
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CERTIFICATE OF COMPLIANCE WITH WORD LIMIT

I hereby certify that this brief complies with L.R. 7.3(d) because the total word count for the body of the brief including headings and footnotes is 7,145.

This the 19th day of June, 2017.

/s/ Ruth M. Greenwood

Ruth M. Greenwood